



5

ON A CASE OF FITS RESEMBLING THOSE ARTIFICIALLY PRODUCED IN GUINEA-PIGS.

By J. HUGHLINGS JACKSON, M.D., LL.D., F.R.S.

THIS is the case of a boy who has fits when his head is touched. The case is in many respects very like that of a guinea-pig rendered "epileptic" by some operation on its spinal cord or sciatic nerve (Brown-Séquard). The patient has an epileptogenous zone, as the guinea-pig comes to have some time after the operation.*

Before going further, I would remark that, using the term epilepsy generically, there are, I think, three classes of epileptic fits:—(1) epilepsy proper; (2) epileptiform seizures; (3) fits depending on discharges beginning in parts of the pons Varolii and medulla oblongata.† The fits my patient have belong, I think, to the third class. In there being persistent local disease (as evidenced particularly by the hemiplegia), the case very much resembles the cases of Brown-Séquard's guinea-pigs, and closely in that there is an epileptogenous zone. I say little of Brown-Séquard's researches on epilepsy, because Mr. Victor Horsley has recently repeated this distinguished physician's experiments, and

* I think it very likely that every patient subject to fits of any class has an epileptogenous zone—that disturbance of the part of the periphery (ento- or epi-periphery) most especially represented in the "discharging lesion" may provoke a fit.

† I refer to a paper in 'Brain,' April, 1886, for details of this classification—
"A Contribution to the Comparative Study of Convulsions."

can speak more definitely of them than I can. That the fits in the case of the guinea-pigs depend on discharges beginning in some part of the pons Varolii or medulla oblongata, or both these divisions of the nervous system, is clear, if they are producible when the parts higher have been taken away (Brown-Séquard). Convulsions are producible in rabbits by rapidly bleeding them when the higher parts are removed. These are similar to asphyxia fits, and depend, like them, on discharges beginning in the respiratory centre. I submit that laryngismus stridulus and spasmodic asthma are owing to discharges beginning in the same centres started by super-venosity.

I do not wish to make too much of one case, the only one of the kind I have seen. I particularly draw attention to the fact that the attacks are not opisthotonic, as malingering boys' fits commonly are. In this patient's case pretence is out of the question. The fits date from the tender age of two and a half years; they occur during sleep.* When awake the fit is not producible if the boy knows he is going to be touched. There is in the hemiplegia clear evidence of local disease of some part of the nervous system. The fits have been witnessed by Sir James Paget, Dr. Bristowe, Mr. Hutchinson, Mr. Savory, Dr. Hughes Bennett, Dr. James Anderson, and Mr. Victor Horsley.

A boy, first seen in consultation with Mr. R. W. Dunn, of Surrey Street, on January 19th, 1886. The patient's age was seven on February 2nd of that year. When about three years old, the patient had a convulsion, about which I obtained no information, except that he "turned up his eyes." His mother attributed this fit to exposure to cold, by the carelessness of his nurse. After this he was "delicate;" he walked at the age of two years and three months, and did not talk till between five and six.

At the age of two and a half years he had a fit, called by his medical man "an ordinary epileptic fit;" it is said to have lasted an hour, but there may have been a succession of fits. There was foaming of the mouth and heavy breathing, and he was convulsed. He has since had four attacks of this kind, or, perhaps, we should say of this degree; the last of them was three months ago. Ever since the first "ordinary epileptic fit," he has had imperfect use of the left arm and leg (*vide infra*).

* I have known epileptiform seizures, beginning in one thumb and affecting one arm, and turning the head to the same side, to occur during sleep.

The most noteworthy thing in this case is that he "began to fall down" occasionally about a month or six weeks before the first fit, that is, before the first so-called "ordinary epileptic fit," which occurred at the age of two and a half years. Ever since he has been subject to these "fallings," which are really fits also. But so far as his father knows the boy never has these seizures unless his head or face be touched; it is to be particularly mentioned that a fit would not occur if he knew he was going to be touched. His mother, to show me what happened, flicked his face with her handkerchief; the boy suddenly collapsed, and would have gone down to the ground had he not at the time been held by his father. He turned red, looked vacant, his respiration stopped, and his eyes were turned to one side. The affair was rapid and soon over—perhaps fifteen seconds or less—so that I did not then accurately note details. Stoppage of respiration was very evident; it had been noticed by other (non-medical) people besides his father and mother. Later, when percussing his head to see if there was a tender spot, he fell down suddenly, having the same symptoms as before. His father said that the boy would have some days fifty "falls" of this sort, and did not believe that ever a day passed without a fit, for fits, no doubt, these "falls" are. Accidentally brushing his head against a curtain would send him down. Touching any part of either side of his head or face would bring on the attacks; according to his father's account it made no difference what part of his head or face was touched. The boy could tell me nothing whatever about the attacks. I think he was unconscious in them, but cannot be certain.* The fits would occur in sleep, as his father supposes, from the boy's head being inadvertently touched by movements of his hands. He carried about with him clear evidences of sudden inopportune falls occurring during his play. When I saw him first there was a sore on one side of his head, the left frontal eminence was much hypertrophied (his father not inaptly, for a layman, said of this swelling that from repeated falls it had become "a permanent ossification"), the right frontal eminence was not so large, and yet it was abnormally

* In the case of the patient who had some of his fits during sleep (see a previous footnote), there was no negative affection of consciousness at the climax of those fits, which began when he was awake. He spoke when his head was much turned to the left. Until on one occasion he made at that stage of the fit a remark relevant to what I was saying, I had supposed him to be then unconscious.

large. Continuing this part of the subject, I pass on to the next visit, when I had the advantage of the help of Dr. James Anderson and Mr. Victor Horsley in investigating the case more fully.

January 25th, 1886. There is a bruise of the right cheek. His mother told him to shut his mouth before she touched his head; she explained that he had bitten his tongue in a recent "fall." He had a habit of running with his tongue protruded; shutting his mouth and bringing his teeth together prevented tongue-biting when he "fell." However, he had only once bitten his tongue; he never bit it in the "severe epileptic attacks."

In the fits we saw he fell down, and seemed to be unconscious; the two eyes turned to the right and upwards in parallelism; his respiration stopped for a few seconds. His father had noticed that in every attack observed since the last visit the eyes turned to the right. When lying down, the fits, on touching his head, seemed to be slighter. When his head was touched whilst he was recumbent his limbs moved; there was but one movement—a sudden jerk—which was soon over. In some the left leg moved alone, or it moved more than the other; possibly the right arm moved more than the left.

Permanent Condition of the Left Limbs.—The face and tongue were moved normally, and so it is believed were the right limbs. The left arm was slightly less than the right in circumference; his father reported that he moved it clumsily, but his grasps were about equal. His father said that when the boy was using the right hand in such an operation as drawing, the left hand was always "going," showing us in imitation movements of his own hand somewhat like those of athetosis. The boy limped slightly with the left leg; it was decidedly less in circumference than the right. There was no foot clonus on either side, and his knee-jerks were supposed to be normal. The patient's chest was well shaped. There was no evidence of rickets.

At my request his father made particular observations on the fits in sleep. He had frequently seen attacks brought on in sleep, when the boy was accidentally touched either by himself or by others. On purposely touching him in sleep, his father observed that (letter, January 27th, 1886) "the movements of the body were exactly the same as when awake; the duration of the apparent unconsciousness the same, and, unless my observations deceived me, the eyes were turned upwards and to the right." It

will be seen that his father, in the part of the letter quoted, does not speak confidently as to the position of the eyes in the fits during sleep. In a further letter, dated February 2nd, he writes: "I have touched him twenty or thirty times during sleep the past two nights, with the result simply of waking him. Three or four times, however, the touch has given him a momentary shock, and his eyes turned up, but I believe not to the right side. The shocks are of such short duration it is difficult to open the lid in time and watch result. If I open the eye preparatory to giving the touch, he awakes." "His aunt, who generally bathes and dresses him, maintains that he is more sensitive on the left side of the head than the right." ("Sensitive" here refers to degree of excitability, of what we may call the epileptogenous zone.) "I have often tried to discover a place on his head more sensitive than another, but have failed to do so; he may be more sensitive on the left side an inch to 2 inches above the ear, but I must not, for fear of misleading you, say that he is; his aunt thinks so, and she has opportunities of observation.

"The last four days he has stated that sometimes he feels his left arm heavy, as though a weight were pulling it down. This may be fatigue from using it. He has been very sensitive the past four days, and has had some severe falls, one on his forehead, and to-day on his chin, which is cut, bruised, and swelled."

February 6th. I saw the patient again. He bore marks of sudden "falls;" there was a cut near the right angle of the mouth; in this "fall" his teeth made a mark on the floor. There was a bruise on his forehead; this was owing to his head coming in contact with the window-sill; this "fall" was consequent on the curtain being blown by the wind against his head. He had had many attacks, and looked dull and apathetic; his father attributed the increased frequency of the attacks to dyspepsia.

The following extract from a letter written by his father (dated March 4th) is important: "At the last interview with you, one of the gentlemen present made the remark that when the boy fell he appeared to be violently drawn down by a muscular contraction. This, I think, is a true remark, for the boy says that he feels pulled down. I had rather a forcible illustration of this recently. He was sitting on my knee whilst I adjusted the band over his eye; in untying the knot, my finger slipped, the vibration caused him a shock, and his eyebrow struck me on the upper lip. Though the

fall was only a few inches—say 3 or 4—the blow was so heavy that my lip was cut, and, at first, I thought my tooth was broken; the blow of his head, by simple gravitation, could not, at the distance of 3 or 4 inches, have struck so heavy a blow. There evidently was a power imparted by muscular contraction. He tells me that he sometimes feels a weight in the left arm. After a shock this morning, he had convulsive movements for a minute in his left arm; the middle finger especially was moved.”

I saw the boy again March 10th. He had cut his upper lip and bruised his nose; one of his recent falls was consequent on his head being brushed by the window curtain. I saw him once more on April 18th. His father said there was a change in the fits. Thus, in one the night before (his brother had put his arm round the patient's neck) he raised his arms above his head, and shrieked and fell; he continued to shriek during less than a minute, and was much exhausted after the fit. The boy could tell nothing about the attack. He had twenty attacks one day; they still never occur unless he be touched. The eyes turn to the right, but sometimes go straight up.

Dr. W. B. HADDEN said he had lately seen a case bearing on Professor Brown-Séquard's experiments on guinea-pigs. A man aged 34 came into St. Thomas's Hospital under the care of Mr. Croft. In 1872 he was shot in the left calf in the Ashantee War. Three or four months afterwards he had fits which continued for a year. He went to the Norwich Hospital to have the sciatic nerve stretched. For twelve years after this he had no fits. Seven weeks before admission to St. Thomas's they commenced again, and were very frequent, 4 or 5 to 8 or 10 per diem. He saw the case with Mr. Croft, and they consulted as to the advisability of operation. He saw one fit. It began with pain in the cicatrix, the sensation passed to the head, convulsive movements then began in the head, then passed to the arm and face; the pupils were inactive, the conjunctivæ insensitive, he did not pass his water, and did not bite his tongue, except once at night, for, as blood was found on the pillow and the tongue was bitten, it was assumed he had had a fit though it had not been seen. When the cicatrix was handled the man had an aura but no fit. Mr. Croft first tried to stretch the sciatic nerve by forcible flexion of the thigh on the pelvis, but severe convulsions followed, and this method was abandoned. A few days after the sciatic was cut down on and smartly stretched both ways. For eleven days after the man had no fit; then they began again at the rate of one a day, or one every other day, but since he left the hospital he has had no fits at all. The history of injury, the fact of the aura beginning in the scar, and the results of stretching, proved that there was some affection of the nerve in the leg. He thought the case was unique, and would like the opinion of the Fellows of the Society on it.

Dr. HUGHES BENNETT thought from observation of Dr. Jackson's case, that the fits were genuine. After the publishing of this case it was not improbable that others would be met with. Since he had seen this case

he had met with more than one other bearing a relation to it. He had a man some months ago under his care who had received a blow on the side of the head. This was followed by epileptic fits which were preceded by a visual aura, especially a red flash of light; after the fit there was an attack of paroxysmal mania. The attacks lasted for six years, three of which, owing to their sequelæ, he spent in an asylum. All the fits were of the same character. This case bore on the present inquiry, because he accidentally produced a fit by pressure on the scar, which corresponded with the angular gyrus, the centre for vision. The fit thus produced had as usual a visual aura. He thought possibly the blow might have some relation to a brain lesion at this spot, and therefore he asked his colleague Mr. Pearce Gould to trephine. This was done, but nothing abnormal was found; the dura mater was opened and the brain punctured in several directions with a probe to find any cyst or abscess that might peradventure exist in the neighbouring cerebral tissue. It is now four months since the trephining, and the man has had no fit since, though for six years previously he had not been a week without one. He considered the interesting points of the case were (1), the essentially visual aura; (2), the portion of the cortex beneath the seat of injury was associated with sight; (3), artificial stimulation of the scar reproduced both aura and fit; (4), trephining has arrested the attack. He referred to another case of a woman who had a kind of sensory aura passing from the finger to the brain, not culminating in a fit. By rough percussion of the outer surface of the skull she was able occasionally to reproduce these attacks.

Dr. EWART regretted he had overlooked the announcement of the paper as he had not had time to find the notes. A year and a half ago he saw a young girl who two years previously had a series of severe convulsive fits lasting over several hours. At the end of that time she was partially paralysed. His memory did not enable him to state whether a sensory aura was observed. She got better of this first series. When brought to me she had had a second longer series of fits. She was in a condition of partial hemiplegia accompanied by contracture; the left heel was drawn up, the gait was awkward, the left hand was carried in a helpless manner, the fingers were rigid and useless. The face for the same cause was vacant and slightly asymmetrical. There was no family history of epilepsy; the mother was a neurotic and excitable woman. He advised the mother to let him take the child into the hospital. The fits became less and ultimately disappeared. She used at first to have about 11 or 12 in a month, but the fits in the continuance of the case were different from those in the beginning—they were momentary, without warning and of great frequency, 30 to 40 per diem, unforeseen and sudden, the child was thrown down and constantly injured. She has now many scars as evidence of this. He did not believe there was any aura. The points of interest in this case were the frequency of the fits, the presence of hemiplegia, their suddenness and force, and the influence of the sensorium on them by way of checking them. When the child's attention was engaged the fits did not occur, but when she was alone and unoccupied they were more frequent. The medical treatment in the hospital was the same as she had had as an out-patient, and therefore he could not consider that the medicine had much to do with checking the fits. He thought the explanation that the sensorium had some checking action on the fits went far to bridge over the apparent discrepancy between the explanations of Dr. Jackson and Dr. Bennett, the former of whom thought the cause resided in the subcerebral centres, while the latter thought that cortical excitation gave rise to the fits. Con-

tinuance or removal of the checking action would allow results to follow or not to follow. In his case there was a unilateral permanent defect of communication between the brain and the limb; stimulation of the side of the cortex suddenly placed the child in the position of a guinea-pig with hemi-section of the cord.

Mr. R. W. PARKER could contribute a case of interest. In 1871 whilst he was house surgeon to Mr. Hutchinson, there was sent from the workhouse to the London Hospital an epileptic with disease of the femur. When dressings were applied, or when the sinus was probed, the man had severe epileptiform seizures. Amputation was performed, and the man had only an epileptic attack afterwards, and that was at the first dressing when the "epileptogenous" area was touched. He saw the man two years afterwards in Whitechapel Road as a boot cleaner; he had then quite lost his fits.

Dr. BEEVOR asked Dr. Jackson why he put the disease in the pons and not in the cortex. How then was there loss of consciousness and drawing of the body to one side showing affection of the muscles of the abdomen? It was well known that in some cases peripheral irritation, such as an annular blister, would stop fits. In Dr. Jackson's case peripheral irritation brought them on. He referred to Charcot's hystero-epilepsy. An area was touched, the first stage was epileptic, then hystero-epileptic. These fits could be stopped (at least they could in France) by ovarian pressure.

Mr. CARTER remembered a case of easily excited epilepsy. The patient, a woman, came to him convinced that the epileptic fits were connected with the irritation of a chronically diseased eye. The condition of the organ demanded removal apart from the supposition. She was partially narcotised by ether, and as the eye was removed from the socket she had a most violent epileptic fit. She never had another. The choroid coat was found converted into a bony mass.

Dr. HUGHLINGS JACKSON, in reply, thought the medulla was the seat of the affection, though he was aware that Mr. Horsley considered it to reside in the cortex. But such fits were producible when the cerebral hemispheres were removed. If rabbits were rapidly bled, almost to death, and their higher centres removed, the same phenomena would follow. He was willing to confess that the case should be treated as a clinical curiosity, but perhaps after its publication others might be brought forward.

Mr. HORSLEY fully endorsed Dr. Jackson's opinion of his opinion. He was conducting his experimental work to find, as far as he could, the seat of the lesion. So far, he had found that the cortex as well as the medulla was concerned. Some twenty observers had made experiments on epilepsy, but no one of them so far had obtained from anywhere but the cortex this triple series of events, namely, firstly a latent period, followed secondly by a period of tonic, and, thirdly, a period of clonic spasm. He looked upon Mr. Hadden's case as an instance of simple nerve-stretching curing epilepsy.